

Defence industries in international relations

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While the threat and use of force remain elements or even possibilities in world affairs, the political importance of the defence industries will be substantial. Defence industries must be viewed as significant because of the contribution that they make to allowing states to deter attack and to use force. But they also have an economic and technological significance. In the UK, France and the US, defence equipment represents about 10 per cent of total manufacturing output. Equipment orders from home and abroad provide employment for around 500,000 people in the UK, at least 300,000 in France, and over two million in the US. The US Department of Defence, the Pentagon, employs 134,000 people just to procure equipment worth about \$130 billion involving 15 million contracts a year. Defence equipment is big business and is particularly important today in the aerospace, electronics and shipbuilding sectors. Between a quarter and a third of professional technologists and scientists in Britain, France and the US work in the defence sector.

The process illuminated below is one in which defence industries, traditionally organized on a national basis, are in various ways becoming more *internationally*-structured. This article describes different sorts of international links, then says why they are proliferating, and finally considers some of the implications of what is underway. In general, defence production is one of the points where government has intensive contact with business or, in academic terms, where politics meets economics.

Although defence industries have a much longer history, this piece begins with the end of the Second World War, by which time governments had asserted their control over the defence manufacturers in their territory. Governments around the world could then acquire arms in one of two ways. They could have them developed and produced on their own territory, or they could buy from a foreign supplier, in which case they needed the consent of the supplier's government. By then success in warfare had come to depend in large measure, although not entirely, on a state's capacity to equip its forces with equipment incorporating high technology. Reliance on external sources of armaments meant that a government had to trust to the goodwill of the supplier's government for future deliveries. In practice the stronger states preferred to concentrate on being as self-sufficient as possible.

Self-sufficiency was easiest for the United States which had its defence factories protected from the war and whose problem was to adapt to lower levels of military demand, at least until the Korean War began. In Europe, defence production became most important in Britain and France, where it was both a symbol of great power status and a means to national autonomy. In both states, continuing a trend begun before 1939, there was a tendency to concentrate resources into fewer firms. This led

eventually to the establishment of a few 'national champion' companies often domestic monopolies, but theoretically able to compete in high technology fields against US companies.

West German arms production could be re-established only after 1955 with the Government originally aiming to spread defence contracts around and to avoid having companies become dependent on defence work. From the 1970s, however, it was accepted in Bonn that in many defence fields companies needed to be big to survive and a policy of national-champion-building occurred in Germany also. This policy is only now being completed with Daimler-Benz recently taking over Messerschmitt Bölkow Blohm to create a huge industrial conglomerate with extensive defence interests.¹ Defence companies have on occasions been nationalised, particularly in France, but that has not prevented them from acting as commercial concerns.

However, even while government manipulation to create *national* defence industrial structures was taking place, international features in addition to simple trade were appearing.

International dimensions of defence industries

Four overlapping international influences should be noted: licensed production, co-production and offsets; international collaborative development and production; sub-contracting from overseas; and multinational corporate defence structures.

Licensed production

The first feature to merit attention was the spread of licensed production, a phenomenon which had existed on a limited scale in the pre-Second World War era. Basically, after 1945, the United States and the European members of NATO perceived a growing threat from the USSR. Especially after the start of the Korean War in 1950 and the admission to NATO of West Germany and Italy in 1955, it was agreed to rebuild European defence industries. Initially the predominant method was for the US to provide financial aid and machine tools to fund the development of European products. The Canberra and Hawker Hunter aircraft were a result of such policies but after 1957 in particular, in order to reduce the number of different weapons types coming into service in NATO, the US turned increasingly to offering European companies licences to build American designed and developed equipment.

Licensed production involved more than just transfers of drawings. It meant considerable informal exchanges of information between the staffs at many levels of the participating companies. In many cases factory-floor fabrication techniques and skills had to be passed on. The result was that, although in some cases a licensed production arrangement led to nothing further, in other cases it led to a sense of trust

¹ The West German Government, which had originally encouraged a Daimler takeover of MBB, decided in September 1989 to overrule the Federal Cartel Office recommendation against the merger. It overruled the Federal Cartel Office since MBB alone faced major problems, in particular in connection with Airbus losses, and it also was seen as being too small to carry great weight in international collaborative negotiations.

and readiness for further co-operation between the firms involved. The most dramatic revelation of such a process came in 1985 in the UK when the Westland company, in severe financial difficulties, turned primarily for help to Sikorsky (United Technologies) whose product it had licence-produced, further developed and successfully marketed as the Sea King helicopter.

Among the advantages of licensed production are that it means that the government buying the equipment pays out less in foreign exchange and generates some domestic employment. Licensing is also flexible, allowing for anything between final assembly of systems supplied in kit form to almost total manufacture of a system and its components. The country granting the licence normally insists on controlling any exports of the licensed product but in some cases such controls can be applied less than rigorously.

Licensed production remains a common feature of arms production on a global scale and in particular it has been used by developing countries as a means of acquiring arms manufacturing capabilities. India is a major licensed producer of Soviet-designed aircraft and currently the USSR seems to be pressing India to continue this relationship rather than have India go ahead and develop its own aircraft.² Within NATO, such major systems as the Multiple Launch Rocket System are subjects of licensed production (organized on a European scale) and there is now some licensed production of European equipment in the US (McDonnell Douglas made the Harrier on this basis). The US in fact insists that any major foreign defence equipment it buys must be manufactured in the US, so many European equipment sales to the Pentagon results in at least some licensed production.

Licensed production involves a country making the equipment its own forces need. However, an alternative method for arms importing country to derive employment and avoid spending foreign exchange on a foreign purchase is to press for *co-production* of parts of a system. This means essentially that the equipment purchaser gets to make *elements* in a system on a large scale because they go into all the complete systems being assembled by the main manufacturer. Belgium, Netherlands, Norway and Denmark had co-production as an important element in their 1976 purchase of the F.16 aircraft, called then the arms sale of the century.

A further possibility is for a sale to be accompanied by an *offset* agreement under which the selling company normally (rather than government) agrees to buy other equipment (which can be military or civil). Offset agreements involving commitments to purchases greater than the value of the revenue from the original sale are not unknown.³ By and large, they are hard to implement and companies dislike having to make them. But they are often unavoidable to conclude a sale. Dassault is currently selling olives and holidays in Greece as an element in a Mirage 2000 sale.⁴

International collaboration

Countries using licensed production buy products which have already been developed. More ambitious and risky is international collaboration on the development and production of new equipment, which is today widely practised. About 15 per cent

² *The Financial Times*, 20 December 1988.

³ Britain obtained a 130 per cent offset commitment from Boeing on the UK purchase of seven AWAC aircraft in 1987.

⁴ *Sunday Times*, 27 March 1988.

of the UK defence equipment budget (and 25 per cent of the German equipment budget) goes on collaborative projects such as Tornado, the Milan anti-tank missile, the FH.70 and so on). Despite the problems of managing such projects, it is clear that they are going to increase in significance in future and could account for 40 per cent of UK equipment spending before too long. France, which for one reason or another has acquired a series of costly, national projects which it must pay for itself, is in deep trouble with its defence budgets. It is hard to see how it can pay for its planned air-launched nuclear stand-off weapons, sea- and ground-launched nuclear missiles, nuclear aircraft carriers, combat aircraft and air-to-air missiles, without drastically increasing defence expenditure. In June 1989 it announced cuts in planned spending and, although no major projects were cancelled, the pace of almost every major project was substantially slowed.

The supposed economic advantages of international collaboration are threefold. It provides guaranteed access to the market of the partner states. It provides inexpensive access to the technological knowledge of partners, and it means that research, development and other costs can be shared. Overall, technical and commercial risks can be shared and reduced. Moreover, collaboration, because it was *ad hoc* and could be run in such a way as to ensure that national technology capabilities were not narrowed as a result, need not compromise any objectives for maximum national self-sufficiency. Although there is a common feeling among outsider observers that the potential gains from international collaboration have rarely been fully harvested in the past, the tide of opinion running in its favour is strong and its importance is likely to increase still further. The British position is that collaborative partners are sought for all major projects, and in the aerospace sector in particular, they are usually forthcoming.

At least until the last four years or so, individual collaborative projects have tended to arise predominantly on an *ad hoc* basis and very much on the initiative of governments. Companies used to prefer national projects in which they did not have to share their secrets with rivals and over which they had complete control. Dassault-Breguet, the French fighter aircraft manufacturer, tended to hold strongly to such views. During the first two decades of defence collaboration, governments promoting collaboration had often to override the preferences of their industrial communities.

However, increasingly since the 1980s began, companies on both sides of the Atlantic have perceived first that governments' political preference for collaborative projects was real and likely to be lasting, and second that the rising costs of developing defence equipment meant that some arrangement for sharing costs, technology, markets and risks was often the only practical way forward.

Thus, companies themselves began to provide considerable initiative in the generation of some collaborative projects. At a modest level, MBB and Matra worked together to offer a drone (a guided pilotless aircraft used for reconnaissance purposes) to the German and French governments. Two German-Italian consortia have got together to develop rival armoured personnel carriers on a private non-governmental basis. Japan's Ishida Group, with the Dual Mode Air Vehicle Co. of the US, is developing a tilt-wing VSTOL aircraft for civil and military use. Less formally, in the negotiations leading up to the 1985 agreement on the European Fighter Aircraft, it is clear that British Aerospace, MBB and Aeritalia were working closely alongside, and perhaps ahead of governmental discussions. Currently the British Aerospace-

Thomson sea-mine detection sonar system has just been adopted by their governments (Britain and France)⁵ and the two companies are also apparently exploring the possibilities for future collaboration on (sea-based) surface-to-air missiles, well in advance of any formal instruction from their governments.⁶

Corporate initiative on collaboration can be facilitated by the build-up of knowledge of each others' expertise and trust which an existing collaborative project generates. Collaborative development requires rivals to work together. When it goes well, corporate ties are strongly reinforced. The reverse is also true and things sometimes go wrong, as they did with Westland and Aerospatiale over the Lynx/Puma/Gazelle collaborative family of helicopters, and between BAe and Dassault-Breguet over the marketing of Jaguar. The French army failed to meet its original commitment to buy the Lynx, and Dassault never had any commitment to the Jaguar project which it inherited when it took over Breguet. Dassault concentrated instead on selling its Mirage aircraft, which were Jaguar rivals.

Such cases, however, are increasingly exceptions rather than norms. Most collaborative defence projects have found favour with the companies involved and they have sometimes sought to set up further efforts, to turn the consortia designed to implement a single project into something more permanent. Rolls Royce and Turbomeca of France, who began collaborating in the 1960s on the Adour engine for the Jaguar, have gone on to work together successfully on helicopter engines. Panavia, the international company responsible for Tornado, has close links with Eurofighter GmbH (the British Aerospace, MBB, Aeritalia, CASA-owned concern which is developing the European Fighter Aircraft). McDonnell Douglas and British Aerospace moved from licensed manufacture in the US of the Harrier to collaborative development of the AV.8B and are working on a future VSTOL aircraft. Their co-operation over VSTOL also assisted their working together on their successful joint bid to supply what was basically the British Aerospace Hawk as the next jet trainer to the US Navy. MBB and Aerospatiale are thinking of closely co-ordinating and perhaps eventually merging their helicopter operations.⁷ In related by civil fields, Airbus Industry and Arianespace have established families of projects.

In the past five years or so defence collaboration has moved also into the early research/pre-development end of the spectrum with companies working together on basic technologies, materials and so on, rather than specific end-products. The Independent European Programme Group, an inter-governmental group promoting equipment co-operation in Europe, has a series of Co-operative Technology Projects in being, while some of the work done in the European Community's Framework research programme (this programme includes Esprit) has military applications. Next, the French 1985 initiative for a European Research Co-ordination Agency (Eureka) has resulted in over 100 collaborative projects being set up on research and development, many of which have military aspects. In the summer of 1989 the IEPG decided to establish its own framework for collaborative research projects, similar to Eureka. The IEPG programme, with initial anticipated funding of 130 million Ecus a year, was entitled Euclid (European Co-operative Long-term Initiative for Defence). Finally there are private arrangements between companies, not all of which have gone into Eureka.

⁵ *Jane's Defence Weekly*, 7 January 1989.

⁶ *Jane's Defence Weekly*, 17 December 1988.

⁷ *The Financial Times*, 19 November 1988.

Sub-contracting from overseas

As an international activity, collaborative projects receive considerable publicity. Sometimes hidden from public view is the sub-contracting from foreign suppliers which is an increasing feature of defence procurement. Contemporary military equipment is often best thought of as a system of many parts and frequently the main contractor looks not only outside the company but also outside the country to supply sub-systems and components. As noted above, sometimes the company is compelled to do so because of the terms of a co-production or offset deal, but increasingly it is done to optimize the chances of obtaining cheap, high-quality supplies and to reduce technological risk. GEC Marconi's head-up displays have gone into the cockpits of a range of US military aircraft. The interdiction version of Tornado uses a terrain-following radar from Texas Instruments. Ironically, 'national systems' from anywhere outside the US are likely to have a strong international content. Table 1 shows

Table 1. *The JAS 39 Gripen multi-role lightweight fighter aircraft*

Built by a Swedish Consortium of	Subsystem	Overseas partners and sub-contractors
SAAB-Scania Volvo-Flygmotor Ericsson Radar Electronics FFV. Arotech	RM12/F404 engine	GE (US)
	Cockpit head up Display	Hughes Aircraft (GM) (US)
	Radar computer & antenna pedestal	Ferranti International (UK)
	Flight control system	GEC Lear Astronics (UK)
	BK47 cannon	Mauser (WG)
	Leading edge flap control	Lucas Aerospace (UK)
	Auxiliary and emergency power	Lucas Aerospace (UK)
	Fuel management and oxygen control equipt.	Intertechnique (FR)
	Wing design & manufacturing assistance	British Aerospace (UK)

Table 2. *RAF requirement: ASR 1238 (anti armour weapon)*

Damocles	ML Aviation	Collab.	Rheinmetall (WG)
SWAARM	Hunting	Collab.	Honeywell (US)
			Diehl (WG)
Vertical ballistic weapon	BAE	Collab.	Mbb (WG)
Maverick	BAE	Licensed	Hughes (US)
Brimstone/Hellfire	GEC/MDS	Licensed	Rockwell (US)
(unnamed)	Hunting	Collab.	MDS, Thorn, Smiths, Normalair-Garrett (GB)
ALAAW	BAE	Collab.	Shorts, GEC Avionics (UK)

just a sample of the role of overseas partners and suppliers in the JAS Gripen aircraft from Sweden, a project which superficially stresses the independence of Sweden's aircraft industry in line with the country's neutrality.

Increasingly in the UK, companies bidding for contracts often team up with foreign companies whose expertise will help them present a better case and which could well end up acting as sub-contractors or even co-developers for major subsystems if a bid is successful. Table 2 shows the bidders for an RAF contract, ASR 1238.

Overall, although only about 8 per cent of MoD contracts are placed with foreign companies, yet about 25 per cent of the content of UK defence equipment is foreign. Although precise figures are not available, it is likely that the equivalent French proportions would be somewhat lower and the German figures considerably higher.

The multinational corporate defence structures

Licensing, *ad hoc* collaborative projects and sub-contracting to overseas suppliers do not represent permanent structures for international defence development and production. However, in addition, the defence multinational corporation, or rather the multinational corporation with substantial defence interests, is already with us. The complete defence multinational controls the shape and level of R&D spending and corporate investment in more than one state. It is thus a more significant institution than joint venture companies such as Panavia and Euromissile which run collaborative projects, and which are controlled by the partner companies.

Multinationals with varying degrees of defence involvement have existed for some time. A stream of examples serves to demonstrate that foreign ownership or a multinational character no longer excludes a company from defence sectors. Some years ago, to facilitate a tank sale, Siemens established a tank sight factory in Belgium to serve the world market. Britain's vital IFF (identification, friend or foe) equipment has been developed and produced by Cossor, which is owned by Raytheon. Currently Dunlop of the UK and Eldec of the US plan a joint electronics firm in Coventry which will have defence accounting for about 50 per cent of its business.⁸ What was Foden's of Sandbach in the UK, manufacturers of military trucks, is now owned by Paccar of the US. A genuine defence multinational is United Scientific Holdings, in Britain the owner of Alvis. This company has defence manufacturing operations in several countries including Egypt, Singapore and the US as well as the UK, with 80 per cent of its Singapore output going to the Pentagon. Last year Royal Ordnance, as part of BAe, set up a US operation with Ensign Bickford to make explosives in Kentucky,⁹ and Thyssen of West Germany is setting up a plant in Canada to make light-armoured vehicles.¹⁰

This move to multinationalism in defence has been accentuated by the mergers and takeovers which have been such a feature of Western economies in recent years. European companies have sought to take advantage of the weak dollar and to secure

⁸ *Jane's Defence Weekly*, 21 January 1989.

⁹ *The Financial Times*, 6 May 1988, *Jane's Defence Weekly*, 14 May 1988.

¹⁰ *Jane's Defence Weekly*, 14 January 1989.

better access to the US market by buying firms in the US. European and American firms have tried better to organize their sales potential in Europe after the Single European Act by buying companies in Europe. Governments have often, if not always, allowed defence operations to be involved in such mergers and acquisitions.

Again, some examples illustrate what has been going on. Scicon, a BP subsidiary and leading British software house with defence interests, changed its legal base of operations from the UK to the US in 1988 and was bought by Systems Designers of the UK (in which BAe had a quarter share). CAP, another major defence software/systems company, acquired an international dimension by merging with Sema Metra of France. In 1988 Ferranti merged with International Signal of the US and became Ferranti International. When much of the Lear Siegler company of the US was sold off in sections, Smiths (UK) bought the systems integration operations in Grand Rapids, GEC bought Lear Siegler Astronics, and British Aerospace bought Steinheil Optronics. These and other cases indicate that defence development and production is becoming established in multinational corporate dimensions. Moreover, the process is far from complete: acquiring a greater multinational character is an element in the strategy of many firms with defence interests in the US and Europe. Sir John Clark, the chairman of Plessey, has said, 'With the integrated European market coming up in 1992 I would like to see an international electronics company genuinely addressing the requirements of the Western world. It will happen.'¹¹ Plessey itself has been the unwilling object of a takeover effort by GEC and Siemens from late 1988. If this goes through, a complex corporate structure will emerge in that elements of Plessey will be absorbed into GEC, while other sections would be owned by Siemens but run by them on an arms length basis so as to protect British security concerns. In the long term, a joint GEC-Siemens takeover of Plessey could well have extensive implications pressing for growing co-operation between the two parent companies.

Also significant is the practice of one defence company holding at least a minority share in foreign firms. The foreign share which United Technologies took in Westland caused an enormous political row but few have observed that Rolls Royce has just taken a 45 per cent share in Sociedad Española de Motores, the Spanish company which will be responsible for Spain's contribution to the EJ.200 engine for the European Fighter Aircraft. Minority shareholding is already quite common and the leader of Daimler Benz, Herr Edzard Reuter recently suggested that Europe's major defence contractors should all take minority shares in each other's equity so as to increase their capacity to hold off competition from US industry.¹²

Overall, to think of defence corporations as national entities under the dominant influence of their home government is less and less appropriate. The development and production of defence equipment is increasingly being organized on an international basis.

Why multinationalism?

After a description of what is going on, attention can be turned to the factors making it happen. In many ways they can be summarized as reflecting the readiness of

¹¹ *The Times*, 2 March 1988.

¹² *The Financial Times*, 1 December 1988.

governments to compromise political preferences for security of supply in order to bring to bear the economic pressures of competition and scale which they hope will bring lower, or rather more bearable, prices. Corporate behaviour reflects changing tolerances and policies on the part of governments.

First, it is necessary to refer back to the points made briefly about international collaboration as providing a means to share financial resources, technology, markets and risks.

In the 1980s these are weighty advantages since the technological content, non-production costs and risks of developing defence equipment have been rising exponentially since 1945. While the prices in real terms of televisions, stereo equipment, videos and computers have been going down, the costs of defence equipment, which is rarely mass produced, have been rising. Faced with defence budgets which are growing slowly if at all, this has pushed governments into collaboration as a means of achieving large-scale production and access to larger markets. The costs of missing out on a collaborative opportunity can be substantial. France must pay alone the full development cost of the Rafale, which will be about £4 billion. Britain will pay about £2 billion as its one-third contribution to the development of the European Fighter Aircraft. The production costs of EFA should also be lower because about 800 aircraft will be made initially rather than the 300 which the French Air Force and Navy need. It is noteworthy that the B.2 bomber (although never a candidate for collaboration) is planned to be the most expensive aircraft ever built at more than \$516 million per copy.¹³

Recognizing the budgetary pressures that governments are under, it is not surprising that companies are becoming enthusiastic about collaboration as a means of winning defence contracts.

However, pertinent governmental attitudes go beyond support for collaboration. Governmental attitudes are very different in the US and Europe but in both cases can support the rise of the multinational defence company. In the US the Government (including even many members of Congress) realizes that it is not able to develop successfully all the equipment its forces need and so is on occasions ready to buy from a foreign concern. It does this only with the proviso that, to ensure security of supply, major systems bought must be made in the US either under licence by a US company or by a US subsidiary of the original manufacturer. For instance, after selling its machine gun to the US in the 1970s, the Belgian FN company set up its own manufacturing plant in the US to make the gun for US forces.

At least to date the US Government has been confident that it can control such foreign subsidiaries because foreign-owned companies in the US supplying defence equipment to the Pentagon are supervised by a board of trustees, approved by the Government, which monitors what the subsidiary does and in particular makes sure that it does not transfer technology out of the US in ways disapproved of by Washington. Also it is true that US readiness to see foreign ownership of defence companies is not unqualified. It vetoed in 1987 a plan by Plessey to take over the Harris company, and there are signs of some political concern about the degree of foreign ownership of US industry in general and defence industry in particular.

In Western Europe a basic attitudinal element is that European co-operation, in defence as in other spheres, is widely regarded as desirable because it promotes

¹³ *Jane's Defence Weekly*, 24 December 1988.

European unity and integration. There is in Europe a political commitment to co-operation which, while scarcely sweeping all before it, has had a persistent influence. It supports defence industrial co-operation, although not yet to the point where the UK can endorse a Thomson takeover of GEC or where France can countenance overt dilution of the national character of its defence industry.

Other European governmental attitudes have much more of an economic basis. Across the countries of Western Europe defence budgets are under pressure as the costs of equipment and manpower rise faster than permitted spending levels. Led by the example of Britain, the major European defence ministries have increasingly sought greater value for money in defence purchases and have been increasingly if reluctantly ready to buy from foreign sources (especially for sub-systems) if that means lower prices. National defence companies such as Thomson CSF, British Aerospace and GEC, while still considerably protected, have recognized that they are likely in future to have to face more direct competition, not just from each other, but also from American and Japanese companies in European and world markets. They are thus seeking to organize their activities on such a scale that they can compete successfully against the likes of General Dynamics, Westinghouse and so on. In principle, their governments endorse this interpretation and response.

The Single European Act, largely about providing a market in which companies can operate on a large scale, is nominally confined to the civil sector. However, European defence ministries are recognizing that the commitments of the Single European Act to introduce greater Community-wide competition for public contracts by 1992, while not legally applicable to much of the defence sector, could in fact be applied usefully to defence and better terms could be obtained. If other government ministries can get away with the political costs of considering bids from across the EC for their equipment supplies, defence ministries are increasingly inclined to do likewise. Thus the Single European Act is having an indirect effect on defence procurement.¹⁴

Finally, European countries, unlike the US, often do not have formal procedures to deal with foreign defence companies, although France does not allow significant defence suppliers to have majority foreign ownership. Elsewhere, unless a company has 'national champion' status, EC countries tend not to be concerned formally about where it is beneficially owned. Instead they look at its financial and quality control procedures, at the security clearances of its staff, and especially at the proportion of a product's value which is generated in the Community.¹⁵ Thus US defence companies which want to buy into Europe to get access to European defence markets, as Hughes Aircraft did in 1988 with Rediffusion, can do so relatively freely. Clearly there is no guarantee that in practice foreign-owned companies will not encounter discrimination with regard to particularly sensitive contracts.¹⁶

Overall, then, governmental attitudes in both the US and in Europe are sometimes permissive and in some ways encouraging about the development of multinational

¹⁴ This is reflected by the discussions held within the Independent European Programme Group and by the reported planned directives to UK ministries (see *The Guardian*, 5 December 1988, and also *The Times*, 18 January 1988).

¹⁵ France argues that 80 per cent of a product's value should be generated in the EC for it to qualify as European. Britain will accept 60 per cent. This has contributed to the dispute over whether Nissan cars from the Sunderland plant can be imported into the rest of the EC as 'European' cars.

¹⁶ Sperry sold its UK operations to British Aerospace in the 1980s because it felt it could not hope for equal treatment from the British Government.

defence companies. Leading British procurement officials are now privately supportive of defence companies acquiring greater European identities, although their French counterparts are likely to be more cautious. Henri Martre, the leader of Aerospatiale, is very concerned about a possible merger of Thomson's military activities with those of British Aerospace. That, he has observed would be 'un veritable Trafalgar' for the French armaments industry.¹⁷

More generally, multinational businesses are an increasingly common feature of international life, not least because they provide a method for European firms to transcend the barriers around the US market and for US firms to sell in what some fear might turn out to be 'Fortress Europe'. Multinationalism is also associated with the benefits of size and, in an era when the initial costs of developing new products in a range of areas from cars to microchips to telecommunications equipment are rising steeply, the multinational corporation is clearly an appropriate body to operate in high technology areas in general.¹⁸ Here it is salient to reiterate that some of the political barriers which hindered the operation of the MNC (multinational corporation) in the defence sector are now being somewhat lowered. Additionally, today there are few hard lines dividing military and civil technology. Overlap is much more common and thus any high technology multinational corporation is likely to have at least defence production potential.

Of course there have been substantial overlaps ever since the industrial revolution began, especially in areas such as metallurgy, mechanical engineering and chemistry. Today, however, defence R&D spending is not much devoted to what might be considered traditional military problems of devising bigger and better explosives and more effective forms of armour to counter them.

Instead the decisive systems of the future, the force multipliers as the US military likes to call them, are concerned with the collection, analysis and distribution of information about the enemy and also about home forces so that the weapons available can be used to greatest effect against the highest priority targets. The military summarize this area as C3I—command, control, communication and intelligence. 'Emerging technologies' are also enabling us (at considerable cost) to deliver modest amounts of explosive accurately on to important static and, in future, moving targets having been launched tens and perhaps hundreds of kilometres away. Clearly this requires powerful miniature jet or rocket engines but, more difficult, it needs the engines and flight controls to be integrated into target acquisition and guidance systems where a range of sensors (infra-red, television, radar and so on) may play a role.

Overall, the very technologies which are seen as the basis of much change in civil life (electronics, data-processing, computing and materials in simple terms) are central also to military advantage. In future, while certainly some companies will specialize in the application of these technologies to military systems, and while many technologies will find more immediate military applications than civil uses, it seems inevitable that existing high-technology multinationals such as Philips, Siemens, GEC and IBM will at least see increasing opportunities for defence work and that military and civil advances will come from a common research and technology base. A high

¹⁷ *Air et Cosmos*, 21 January 1989.

¹⁸ See for instance, G. Dicken, *Global Shift*, and M. E. Porter (ed), *Competition in Global Industries* (Boston, Mass., 1986).

technology company is under pressure to become multinational, and it is likely to have defence capabilities.

The implications

To recap, the argument so far is that national companies can no longer be seen as the dominant influence they once were in defence production, that defence equipment development and production is becoming increasingly a multinational affair in various ways.

This is taking place because rising costs and risks make it necessary for companies and governments to share each other's markets, financial resources and technological knowledge. Additionally, governmental attitudes are such that, within NATO, governments are a little more ready to place more reliance on foreigners and foreign supplies than previously, so that they can equip their forces with suitably advanced equipment. Lastly, defence cannot easily be insulated from the trend towards the multinational organization of high technology business since it draws on much of the high technology base utilized by the civilian economy.

Briefly there are two sorts of implication from all this. They concern policy and theory respectively. There are clearly major implications for government policies. Left to themselves, defence companies will go as international as they can in their operations so as to maximize their access to markets and minimize the price of their products. I understand that some UK defence equipment may already include ball-bearings from the USSR. Such trends on the part of business could be perceived prior to the First World War when government control was not enforced.¹⁹ Governments must reconsider what limits they want to set. There are already signs in the US of concern about foreign ownership of US industry in general but in Europe there is a need for governments to decide whether they are ready to see what are still national defence policies underpinned by Community-wide defence companies and/or firms controlled from the US.

Some of the specific policy questions given added sharpness by the developments discussed here are as follows:

- (1) The stated political preference of the US is for maximum self-sufficiency of defence supply, and the professed political goals in Europe are for a competitive but *European* defence industry. Business behaviour, however, is pressing European firms into the US and American firms into Europe. How much do governments want to restrict such development? Moreover, what would be the US Government's response to increased European self-sufficiency in defence equipment and to perceptions of exclusion from the European defence market?
- (2) Can governments accept the europeanization of national corporate bases in Europe, such as GEC, Daimler Benz and British Aerospace? At present this would be a difficult political pill to swallow, particularly in France.²⁰ The UK Government had

¹⁹ See Noel-Baker, *The Private Manufacture of Armaments* (London, 1938); R. Lewinsohn, *The Profits of War* (London, 1936); and H. C. Engelbrecht and F. C. Hanighen, *The Merchants of Death* (New York, 1934).

²⁰ Edward A. Kolodziej, *Making and Marketing Arms* (Princeton, 1987), especially ch. 4.

to face the prospect of Siemens acquiring a major stake in Plessey and found it difficult to draw up suitable conditions, not just to promote the maintenance of competition in certain fields, but also to promote British security interests. Despite verbal commitments to European defence co-operation and letting companies rather than dirigiste state policies decide corporate structures, governments may still have major reservations when presented with the reality of transnational mergers and acquisitions. These reservations may be greatest with regard to German acquisitions since there are clearly elements in the UK Government (and in the US) which regard West Germany as a substantial risk. There are particular doubts about its reliability with regard to sensitive command, control, communications and intelligence equipment, especially in naval fields.

(3) What balance do European governments want to see between competition and collaboration in defence contracts? The tendency towards building national champions, most recently in Germany through the growth of Daimler-Benz and in France through Sextant becoming the dominant avionics company, means that at the systems level it may be difficult to have collaboration with much element of competition. This is particularly true in the combat aircraft, air-to-air missiles and aircraft engine areas and it may be the case soon with airborne radars. Certainly Ferranti will find it hard to continue competing in that field if it fails to get the EFA contract. How many combat airframe companies should Western Europe support, given that future aircraft are likely to be collaborative?

(4) Are Europeans ready to accept companies which are monopolies or oligopolies within Europe on the grounds that their size will enable them to compete effectively on the global scale? The answer to date is a qualified yes with governments being more or less content with the performance that the national monopoly or near monopoly has generated. In Britain the MoD has not been impressed with several GEC projects but it has found less cause for complaint with BAe and Rolls Royce. Bonn was clearly unhappy with MBB as Germany's dominant aerospace concern and therefore encouraged Daimler-Benz to move in. French officials have private reservations about Dassault's behaviour as the country's only combat aircraft developer, especially its failure to secure participation in collaborative projects. There is thus no constant pattern.

(5) How much extra-NATO dependence is acceptable if defence companies turn increasingly to sources of cheaper labour for components? One US Air Force general remarked recently that the Koreans 'make great parts' and BAe has just set up a joint venture with manufacturing potential in Singapore.²¹

(6) How are governments to control the exports and technology transfers of multinational defence companies? Will a European level decision-making forum become necessary, as a European Parliament report argued six years ago?²² Plainly governments will be reluctant to acknowledge surrender of national control over arms exports. Yet they will be under pressure so to do if the structure of defence manufacturing evolves to the stage where production is so spread across Europe that allowing every government an arms export veto might paralyze arms exports. Alternatively, defence producers might choose to concentrate production in those

²¹ *Asian Defence Journal* (October 1988), p. 141.

²² Report for the Political Committee on 'Arms Procurement within a Common Industrial Policy and Arms Sales', European Parliament Working Documents, Doc. I-445/83, 27 June 1983.

states (the UK, France and for some equipment Belgium) where export restrictions are predictable and modest. There is little public feeling in those countries against arms sales as such. The arms export issue is one which has become significant at both ends of the spectrum. At one end, Norway is preparing to ease its extensive arms export restrictions to facilitate its participation in collaborative projects such as the Penguin anti-ship missile. At the other, there are doubts in Western Europe about the reliability of West Germany as a future collaborative partner because of fears that its historically permissive attitude towards the sales of collaborative equipment might harden in an age of détente. As in other areas, a European dimension to arms export decision-making could be a way of binding Germany closer to the rest of the European Community and of reducing its tendency to go its own way.

Should the pressures of business rather than politics continue to carry enhanced weight, it is not difficult to see that demands will accumulate to ease political restrictions on arms trading, technology transfer and corporate structures. Should Mr Gorbachev's favourable image and East-West détente be sustained, reduced defence budgets might force further rationalizations and restructuring among Europe's defence firms. Moreover, the idea of more 'trading with the enemy' might become more acceptable. The West already allows the USSR to display combat aircraft at its air shows. The US aerospace industry was helping China to develop its capabilities (with the programmes involved having been disrupted by the US official response to the political problems in China in 1989). The USSR is reported to be interested in having Rolls Royce help it to develop its civil aircraft engine technology. This might be commercially attractive at some stage for Rolls but it is not necessarily in the Western security interest.

Lastly, there are implications for the ways in which we think in conceptual terms about international behaviour and for the different approaches which exist within the subject of International Relations. It is not easy to express this clearly and briefly, but a starting point is that the provision of an effective defence is traditionally seen as a fundamental duty of, and justification for, the sovereign nation state. Indeed defence policy is most often discussed in the terminology of the school of power politics. This stresses the centrality of the state, the inevitability of conflicting interests in human societies, the moral limitations of the human being, the love of power found in many individuals, and the structural problems associated with establishing lasting co-operation between sovereign entities, and so on. It seems ironic and probably contradictory that, in order to explain the increasing scale of industrial co-operation in the defence field, International Relations scholars must look to the motives and concerns of manufacturing corporations as well as governments. In general, scholars may best be able to explain international defence industrial co-operation by reference to alternative ideas which stress the human capacity for long-term rational action, the frequency of harmonious interests among humans, and the potential of human beings to build progress based on co-operation on a larger and larger scale beyond the confines of the state. In short, if nothing else, developments on the defence industrial front seem to undermine the contribution of Power Politics thinking to our understanding of defence policy, a broad area where such thinking has been traditionally dominant.

Moreover, everything so far underlines that the provision of the equipment needed for effective defence is beyond the capability certainly of any single European state

and probably beyond that of the US itself. Thirty years ago John Herz pointed to the functional obsolescence of the state because its borders had become permeable to nuclear and high explosives carried by missiles and bombers.²³ In his reasoning, the state could no longer fulfil its main task of protecting the physical security of its citizenry and he concluded then that the state would be eroded as a human institution. Such a grand conclusion is not justified from this modest analysis of defence industrial structures. But it does seem that, as in many other areas of life, despite the preferences of many for maximum national freedom of action, there are strong defence industrial pressures at work for the emphasis on the state and national autonomy to be relocated on to at least a Western European basis. This view about defence is compatible with the wider view about economic and monetary developments in Western Europe which asserts that there is a need to look again at neo-functionalist ideas with their stress on processes of spillover. Let the last word go to a much-publicized industrialist: 'Everywhere in Europe companies are giving up sovereignty because of the costs involved in research and development. The extent and speed of technological changes are such that no one thinks he is capable of doing it all on his own.'²⁴

²³ *International Politics in the Atomic Age* (New York, 1959).

²⁴ Sir Arnold Weinstock, *Financial Times*, 30 December 1988.